

REMARKS

The Applicants hereby submit the present Amendment And Request For Reconsideration in response to the Office Action of 16 March 2006 for the above-referenced patent application, entry of which is earnestly solicited.

In the present Amendment, claims 1, 6, 12 and 17 have been amended; claims 2, 3, 9, 13, 14, and 20 have been canceled. Claims 23-30 have been earlier withdrawn. Thus, claims 1, 4-8, 10-12, and 15-19 as amended are pending in the application for reconsideration. No new matter has been entered by such amendment; most of the inserted limitations are drawn from dependent claims of the application which have been canceled. Thus, the Applicants respectfully request entry of the Amendment and reconsideration of the claims as amended.

In the Office Action of 16 March 2006, the Examiner objected to the drawings for failing to show the detail specified in claims 9 and 20. In response, the Applicants merely delete claims 9 and 20 to alleviate the Examiner's concern. Despite the cancellation of claims 9 and 20, such subject matter is well within the scope of the pending claims as well understood by those of ordinary skill in the art.

In the same Office Action, the Examiner noted that no PTO 1449 form was provided in the initial IDS submission. In response, the Applicants resubmit such IDS with the PTO 1449 form along with a few additional identified references. The Applicants respectfully submit that the IDS with PTO-1449 references were indeed submitted along with the originally-submitted application on 30 September 2003. The four non-U.S. patent document references in this IDS submission appear to be listed as NPL documents on Public PAIR, although these images are not available for viewing on Public PAIR. The Applicants assume that the four NPL document references originally provided are available to the Examiner and, if not, the Applicants will again provide such references upon the Examiner's request.

In the same Office Action, the Examiner rejected claims of the application under 35 U.S.C. § 102 and 103 based on the Applicant's disclosed prior art in figure 10 as well as references such as Fukuzawa (U.S. Patent No. 6,338,399 B1) or Yuasa (U.S. Patent No. 6,905,780). In response, the Applicant respectfully submit that the claims as amended are allowable over the prior art of record at least for the following reasons.

In particular, the prior art of record fails to adequately teach, suggest, or render obvious the present invention as defined by the claims. The claims as amended are directed to a spin valve sensor comprising an AP pinned layer structure which is magnetically pinned by an antiferromagnetic (AFM) pinning layer. One of the first and the second AP pinned layers of the AP pinned layer structure consists of cobalt and includes no iron content, and the other one comprises a cobalt-iron layer. In this sensor, the free layer structure includes at least a cobalt-iron layer.

The Examiner refers to figure 10 of the present application as admitted prior art, but such prior art does not teach or suggest that one of the AP pinned layers consists of cobalt and includes no iron content and the other AP pinned layer includes cobalt-iron.

In the Fukuzawa reference, the passage that the Examiner directs the Applicants' attention to at column 30 at lines 65-67 makes reference to the use of pure cobalt in the free layer but not in the AP pinned layers. Further, this passage states that "soft magnetic characteristics could not be realized" with use of pure cobalt, which teaches away from such use of pure cobalt. Thus, there is no adequate suggestion or motivation to combine the use of the teachings of cobalt materials in Fukuzawa with the teachings of the Applicants' admitted prior art.

Further, in the Yuasa reference, the passage that the Examiner directs the Applicants' attention to at column 12 at lines 20-24 makes reference to both the free layer and the pinned layer being made with such materials. This is not what is claimed. Further, the passage in Yuasa states that "the Fe concentration effective for increasing the resistance change ΔR falls within a range of between 25 atomic % and 75 atomic %, more preferably between 40 atomic % and 60 atomic %" which teaches away from such

use of pure cobalt. The graph of FIG. 6 of the Yuasa reference clearly reveals that, where Fe concentration is at zero, poor results are achieved which is undesirable for use. Thus, there is no adequate suggestion or motivation to combine the use of the teachings of cobalt materials in Yuasa with the teachings of the Applicants' admitted prior art.

As apparent, none of the prior art teaches or suggests the use of cobalt in one of the AP pinned layers and cobalt-iron in the other AP pinned layer, where cobalt-iron is utilized in the free layer.

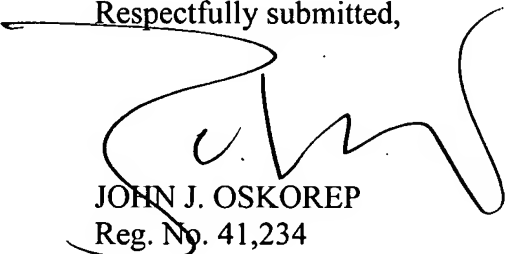
As discussed in the present application, one advantage of the use of such materials is that the magnetoresistive coefficient $\Delta r/R$ of the sensor is increased. Specifically, with use of cobalt in only one of the AP pinned layers, the $\Delta r/R$ of the spin valve sensor may be increased between 5 – 10 %. The use of cobalt in the free layer structure results in relatively larger coercivity, and cobalt-iron (not cobalt) is utilized in the free layer structure. Properties other than $\Delta r/R$, such as magnetostriction, remain suitable for the application. These may be considered unexpected results.

Additional reasons for allowability of several dependent claims are not further described as these rejections are now moot in light of the response provided above.

The Applicants respectfully requests entry of the amendment and reconsideration of the claims as amended. Based on the above, the Applicant submit that all pending claims are allowable over the prior art of record and that the present application is now in a condition suitable for allowance.

Thank you. Please feel free to contact the undersigned if it would expedite the prosecution of the present application.

Respectfully submitted,


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